

MICHEL DELFOUR, Centre de Recherches Mathématiques et Département de Mathématiques et de Statistique,  
Université de Montréal

*Approximation of the dose for thin coated stents in interventional cardiology*

Stents are used in interventional cardiology to keep a diseased vessel open. New stents are coated with a medicinal agent to prevent early reclosure due to the proliferation of smooth muscle cells. It is the dose of the agent which effectively acts on the cells in the wall of the vessel. This paper gives mathematical models of the dose for a periodic stent and an asymptotic stent. It studies the effect of the number of struts and the ratio between the area of the coated struts and the targeted area of the vessel. Theoretical and numerical results are presented with emphasis on the critical choice of finite element approximations for diffusion-transport equations in the presence of the stent which behaves as a Neumann sieve at the interface between the lumen and the wall of the vessel. (joint paper with A. Garon (Ecole Polytechnique and Vito Longo (Université de Montreal)